# Ronan Le Bras

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Current Position	Allen Institute for Artificial Intelligence Research Scientist	une 2016 - now
Education	Ph.D. in Computer Science Cornell University, Ithaca NY, USA	2009 - 2016
	Advisor: Prof. Carla P. Gomes Committee: Prof. Carla P. Gomes, Prof. Bart Selman, Prof. John E. Hopcroft Thesis: Leveraging Human Insights into Problem Structure for Scientific Discovery	
	M.S. in Computer Engineering Ecole Polytechnique Montreal, Montreal QC, Canada	2008 - 2009
	Advisor: Prof. Gilles Pesant Thesis: Applying Probabilistic Message-Passing Algorithms to Search Heuristics for Solving Constraint Satisfaction Problems *Nominated for the best 2010 University Master's Thesis*	
	<b>B.Eng.</b> in Software Engineering <b>Ecole Polytechnique Montreal</b> , Montreal QC, Canada *Degree with highest honors*	2004 - 2008
	C.P.G.E. in Mathematics and Physics Montaigne, Bordeaux, France	2001 - 2004
Research Interests	Commonsense Reasoning; Natural Language Understanding; Computational Sustainability; Combinatorial Optimization; Artificial Intelligence; Automated Reasoning; Big Data; Machine Learning; Bayesian Inference; Human Computation; Crowdsourcing	
Scholarships	Alexander Graham Bell Canada Graduate Scholarship Natural Sciences and Engineering Research Council of Canada (NSER	2009 - 2010 C)
	Masters Research Scholarship Fonds québécois de la recherche sur la nature et les technologies (FQR)	2009 - 2010 NT)
	J.A. Desève Funds Scholarship Fonds J.A. Desève	2009

# Scholarship for excellence in Master's program

2008 - 2009

Interuniversity Research Centre on Enterprise Networks, Logistics and

 ${\bf Transportation}~({\bf CIRRELT})$ 

# Scholarship for excellence

2004

Rotary International, The Rotary Foundation

# Teaching Experience

# Teaching Assistant

Spring 2016

Cornell University, Department of Computer Science

Head TA for the course Introduction to Analysis of Algorithms

**Guest Lecturer** Spring 2013

Cornell University, Department of Computer Science Graduate course, Topics in Computational Sustainability

Teaching Assistant Fall 2010

Cornell University, Department of Computer Science Review sessions and office hours in Artificial Intelligence \*TA Award of Excellence\*

Jan-Dec 2007 Teaching Assistant

University of HEC Montreal, Department of Quantitative Methods Lectures and tutorials in Probability and Statistics

Teaching Assistant Jan-Dec 2007

Ecole Polytechnique Montreal, Department of Computer Science Lectures and lab sessions in Computer Architecture Lab sessions in Programming Language  $(C^{++})$ 

Research & Development Experience

2009 - 2016 Cornell University full-time

Research Assistant to Prof. Carla P. Gomes Research in Computational Sustainability

> Ecole Polytechnique Montreal Jan-Apr 2008

> Research Assistant to Prof. Gilles Pesant part-time Research on constraint-centered search heuristics for combinatorial problems

Caisse de dépôt et placement du Québec

May-Aug 2007 Intern, Market-risk Department full-time

Improvement of market data processes; automation of financial portfolio values computation

Univoc Services Inc.

May-Dec 2006

Scientific Programmer, R&D Department

Numerical designs for a speech-recognition analyzer system based on Monte-Carlo simulations; integration of numerical functions within a graphical user interface

Professional Service

PC member

AAAI 2011/2017/2018/2019/2020 CPAIOR 2013 IJCAI 2013/2015

Reviewer

AAAI 2010/2011/2013-2015/2017-2020

Annals of Mathematics and Artificial Intelligence

CP 2010/2011/2016 CPAIOR 2012-2014 **EMNLP 2020** 

IJCAI 2013/2015/2020

**INFORMS** Journal of Computing

ITCAI 2010

Journal of Combinatorial Designs Journal of Machine Learning Research

NAACL/NeuralGen 2019 NAACL/SemEval 2019

**SAT 2013** 

SIAM Journal on Discrete Mathematics (SIDMA)

SoCS 2013/2014

full-time

### Conferences and Journals

# [2021]

- [1] Hwang, J. D., Bhagavatula, C., **Le Bras**, R., Da, J., Sakaguchi, K., Bosselut, A., and Choi, Y. (2021). Comet-atomic 2020: On symbolic and neural commonsense knowledge graphs. *AAAI*
- [2] Lourie, N., Le Bras, R., Bhagavatula, C., and Choi, Y. (2021). Unicorn on rainbow: A universal commonsense reasoning model on a new multitask benchmark. *AAAI*
- [3] Lourie, N., Le Bras, R., and Choi, Y. (2021). Scruples: A corpus of community ethical judgments on 32, 000 real-life anecdotes. AAAI
- [4] Bosselut, A., Le Bras, R., and Choi, Y. (2021). Dynamic neuro-symbolic knowledge graph construction for zero-shot commonsense question answering
- [5] Gabriel, S., Bhagavatula, C., Shwartz, V., **Le Bras**, R., Forbes, M., and Choi, Y. (2021). Paragraph-level commonsense transformers with recurrent memory. *AAAI*

# [2020]

- [6] Shwartz, V., West, P., **Le Bras**, R., Bhagavatula, C., and Choi, Y. (2020). Unsupervised commonsense question answering with self-talk. In *EMNLP*
- [7] Qin, L., Shwartz, V., West, P., Bhagavatula, C., Hwang, J. D., **Le Bras**, R., Bosselut, A., and Choi, Y. (2020). Back to the future: Unsupervised backprop-based decoding for counterfactual and abductive commonsense reasoning. In *EMNLP*
- [8] Rudinger, R., Shwartz, V., Hwang, J. D., Bhagavatula, C., Forbes, M., **Le Bras**, R., Smith, N., and Choi, Y. (2020). Thinking like a skeptic: Defeasible inference in natural language. In *Findings of EMNLP*
- [9] Marasović, A., Bhagavatula, C., Park, J., **Le Bras**, R., Smith, N. A., and Choi, Y. (2020). Natural language rationales with full-stack visual reasoning: From pixels to semantic frames to commonsense graphs. In *Findings of EMNLP*
- [10] Yang, Y., Malaviya, C., Fernandez, J., Swayamdipta, S., **Le Bras**, R., Wang, J., Bhagavatula, C., Choi, Y., and Downey, D. (2020). Generative data augmentation for commonsense reasoning
- [11] **Le Bras**, R., Swayamdipta, S., Bhagavatula, C., Zellers, R., Peters, M. E., Sabharwal, A., and Choi, Y. (2020). Adversarial filters of dataset biases. *ICML*
- [12] Bhagavatula, C., **Le Bras**, R., Malaviya, C., Sakaguchi, K., Holtzman, A., Rashkin, H., Downey, D., Yih, S. W.-t., and Choi, Y. (2020). Abductive commonsense reasoning. *ICLR*
- [13] Jensen, N., Lyons, E., Chebelyon, E., Le Bras, R., and Gomes, C. (2020). Conspicuous monitoring and remote work. *Journal of Economic Behavior and Organization*
- [14] Sakaguchi, K., **Le Bras**, R., Bhagavatula, C., and Choi, Y. (2020). Winogrande: An adversarial winograd schema challenge at scale. *AAAI*, \*Outstanding Paper Award\*
- [15] Bisk, Y., Zellers, R., Le Bras, R., Gao, J., and Choi, Y. (2020). Piqa: Reasoning about physical commonsense in natural language. AAAI

#### [2019]

- [16] Sap, M., Rashkin, H., Chen, D., Le Bras, R., and Choi, Y. (2019). Social iqa: Commonsense reasoning about social interactions. *EMNLP*
- [17] Huang, L., Le Bras, R., Bhagavatula, C., and Choi, Y. (2019). Cosmos qa: Machine

reading comprehension with contextual commonsense reasoning. EMNLP

[18] Hopkins, M., **Le Bras**, R., Petrescu-Prahova, C., Stanovsky, G., Hajishirzi, H., and Koncel-Kedziorski, R. (2019). Semeval-2019 task 10: Math question answering. In SemEval@NAACL-HLT

#### [2018]

[19] Sap, M., Le Bras, R., Allaway, E., Bhagavatula, C., Lourie, N., Rashkin, H., Roof, B., Smith, N. A., and Choi, Y. (2018). Atomic: An atlas of machine commonsense for if-then reasoning. In AAAI

# [2017]

- [20] Hopkins, M., Petrescu-Prahova, C., Levin, R., **Le Bras**, R., Herrasti, A., and Joshi, V. (2017). Beyond sentential semantic parsing: Tackling the math sat with a cascade of tree transducers. In *EMNLP*
- [21] Xue, Y., Bai, J., **Le Bras**, R., Rappazzo, B., Bernstein, R., Bjorck, J., Longpre, L., Suram, S. K., van Dover, R. B., Gregoire, J., et al. (2017). Phase-mapper: An AI platform to accelerate high throughput materials discovery. In the 29th Conference on Innovative Applications of Artificial Intelligence, IAAI'17, \*IAAI Innovative Application Award\*
- [22] Diaz, M., Le Bras, R., and Gomes, C. P. (2017). In search of balance: The challenge of generating balanced latin rectangles. In the Fourteenth International Conference on Integration of Artificial Intelligence and Operations Research Techniques in Constraint Programming, CPAIOR'17
- [23] Suram, S. K., Xue, Y., Bai, J., **Le Bras**, R., Rappazzo, B., Bernstein, R., Bjorck, J., Zhou, L., van Dover, R. B., Gomes, C. P., et al. (2016). Automated phase mapping with agilefd and its application to light absorber discovery in the V–Mn–Nb oxide system. *ACS Combinatorial Science*

## [2016]

[24] Xue, Y., Ermon, S., **Le Bras**, R., Gomes, C. P., and Selman, B. (2016). Variable elimination in the fourier domain. In the 33rd International Conference on Machine Learning, ICML'16

## [2015]

- [25] Zou, T., Le Bras, R., Salles, M., Demers, A., and Gehrke, J. (2015). Cloudia: a deployment advisor for public clouds. *The VLDB Journal*, \*Special Issue on the Best Papers of VLDB 2013\*
- [26] Ermon, S., **Le Bras**, R., Suram, S. K., Gregoire, J. M., Gomes, C. P., Selman, B., and van Dover, R. B. (2015). Pattern decomposition with complex combinatorial constraints: Application to materials discovery. In the 29th Conference on Artificial Intelligence, AAAI'15

# [2014]

- [27] **Le Bras**, R., Xue, Y., Bernstein, R., Gomes, C. P., and Selman, B. (2014). A human computation framework for boosting combinatorial solvers. In *the 2nd AAAI Conference on Human Computation and Crowdsourcing*, HCOMP'14
- [28] **Le Bras**, R., Gomes, C. P., and Selman, B. (2014). On the erdos discrepancy problem. In the 20th International Conference on Principles and Practice of Constraint Programming, CP'14
- [29] Le Bras, R., Bernstein, R., Gregoire, J. M., Suram, S. K., Gomes, C. P., Selman,

B., and van Dover, R. B. (2014). A computational challenge problem in materials discovery: Synthetic problem generator and real-world datasets. In the 28th Conference on Artificial Intelligence, AAAI'14

# [2013]

- [30] Le Bras, R., Bernstein, R., Gomes, C. P., and Selman, B. (2013). Crowdsourcing backdoor identification for combinatorial optimization. In the 23rd International Joint Conference on Artificial Intelligence, IJCAI'13
- [31] **Le Bras**, R., Gomes, C. P., and Selman, B. (2013). Double-wheel graphs are graceful. In the 23rd International Joint Conference on Artificial Intelligence, IJCAI'13
- [32] Zou, T., Le Bras, R., Salles, M. V., Demers, A., and Gehrke, J. (2013). Cloudia: a deployment advisor for public clouds. In the 39th International Conference on Very Large Data Bases, VLDB'13
- [33] **Le Bras**, R., Dilkina, B., Xue, Y., Gomes, C. P., McKelvey, K. S., Montgomery, C., and Schwartz, M. K. (2013). Robust network design for multispecies conservation. In the 16th Conference on Artificial Intelligence, AAAI'13
- [34] Dilkina, B., Gomes, C. P., Lai, K., **Le Bras**, R., McKelvey, K. S., Sabharwal, A., Schwartz, M. K., Suter, J., and Xue, Y. (2013). Large conservation landscape synthetic and real-world datasets. In *the 16th Conference on Artificial Intelligence*, AAAI'13
- [35] Finger, M., Le Bras, R., Gomes, C. P., and Selman, B. (2013). Solutions for hard and soft constraints using optimized probabilistic satisfiability. In the 16th International Conference on Theory and Applications of Satisfiability Testing, SAT'13

#### [2012]

- [36] Le Bras, R., Gomes, C. P., and Selman, B. (2012). From streamlined combinatorial search to efficient constructive procedures. In the 15th Conference on Artificial Intelligence, AAAI'12
- [37] Le Bras, R., Ermon, S., Damoulas, T., Bernstein, R., Gomes, C., Selman, B., and van Dover, R. B. (2012). Materials discovery: New opportunities at the intersection of constraint reasoning and learning. In *International Conference on Computational Sustainability*, CompSust'12
- [38] Ermon, S., **Le Bras**, R., Gomes, C. P., Selman, B., and van Dover, R. B. (2012). Smt-aided combinatorial materials discovery. In the 15th International Conference on Theory and Applications of Satisfiability Testing, SAT'12

## [2011]

[39] Le Bras, R., Damoulas, T., Gregoire, J. M., Sabharwal, A., Gomes, C. P., and van Dover, R. B. (2011). Constraint reasoning and kernel clustering for pattern decomposition with scaling. In the 17th International Conference on Principles and Practice of Constraint Programming, CP'11

#### [2009]

[40] Le Bras, R., Zanarini, A., and Pesant, G. (2009). Efficient generic search heuristics within the embp framework. In the 15th International Conference on Principles and Practice of Constraint Programming, CP'09

## Workshops

# [2012]

[41] Le Bras, R., Bernstein, R., Gomes, C. P., Selman, B., and van Dover, R. B. (2012).

Human computation for combinatorial materials discovery. In the Human Computation for Science and Computational Sustainability NIPS Workshop, HCSCS'12

## [2010]

[42] Le Bras, R., Damoulas, T., Gregoire, J. M., Sabharwal, A., Gomes, C. P., and van Dover, R. B. (2010). Computational thinking for material discovery: Bridging constraint reasoning and learning. In the 2nd International Workshop on Constraint Reasoning and Optimization for Computational Sustainability, CROCS'10

# **Technical Reports**

# [2012]

[43] Le Bras, R., Perrault, A., and Gomes, C. (2012). Polynomial time construction for spatially balanced latin squares. Technical report, http://hdl.handle.net/1813/28697, "eCommons Cornell University"

#### References

# Carla P. Gomes, Ph.D.

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